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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,548	02/26/2004	Richard Gustafson	UNIV0319	7056

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EXAMINER
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CHAN, CEDRIC A

ART UNIT	PAPER NUMBER
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1797

MAIL DATE	DELIVERY MODE
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08/06/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/788,548	<b>Applicant(s)</b> GUSTAFSON ET AL.	
	<b>Examiner</b> Cedric A. Chan	<b>Art Unit</b> 1797	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 April 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 19,20,23-28,30-38 and 44-57 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19,20,23-27,32-34,44-47 and 50-57 is/are rejected.
- 7) ☒ Claim(s) 28,30,31,35-38,48 and 49 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/15/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. The amended drawings submitted April 15, 2008 are acknowledged.
2. The amendments to the claims submitted April 15, 2008 are acknowledged.  
Claims 1-18, 29, 21-22, and 39-43 have been cancelled, and claims 46-57 have been added. Currently, claims 19, 20, 23-28, 30-38, and 44-57 are pending.
3. The arguments presented in the Applicants' remarks submitted April 15, 2008 have been fully considered but many are moot in view of the new rejections below herein.

### ***Response to Arguments***

4. Applicant's arguments, see Remarks, filed April 15, 2008, with respect to the rejection(s) of claim(s) 19, 23-27, and 44-45 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of 35 U.S.C. 103(a) – see below.
5. Applicant's arguments, see Remarks, filed April 15, 2008, with respect to the rejection of claims 28, 30-31, and 35-38 have been fully considered and are persuasive. The rejection of claims 28, 30-31, and 35-38 has been withdrawn.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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7. **Claims 51-57** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 51 recites "a sample volume configured to receive ..." however, it is unclear to the examiner how said "sample volume" might be "configured" as claimed. As commonly understood in the art, a "volume" is a quantitative measure that is inherent to an object, and thus it is unclear how exactly this inherent property might be "configured." Clarification required.

#### ***Claim Rejections - 35 USC § 103***

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. **Claim 19, 27 and 44-47** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang (US 6,806,955) in view of Lichtwardt et al. (US 5,902,749).

Jang teaches a method and apparatus for measuring physical and chemical properties of fibers and fiber-like particles (see Title/Abstract). The system of Jang comprises a light source (1) for applying excitation light at a selected wavelength to fibers to produce fluorescence emission light having a fluorescent spectral distribution (see Col. 8 line 65 thru Col. 9, line 9). A Xenon lamp may be used as the light source, for example (see Col. 9, line 7).

The system further comprises a detector (2) for detecting/monitoring the intensity of excitation light, and an excitation/collection optics system including filters and a dichroic mirror (see Col. 9, lines 12-23). The light/optics system further comprises a beam splitter (5) and collection optics (6,9) including lenses, cameras, and/or fiber optics (see Col. 9, lines 35-40). Barrier/bandpass filters (7,10) allow for selecting different and/or same regions of fluorescence emissions to be detected, analyzed, and/or imaged.

A fluorescence detector/imaging/spectral analyzer (8, 11) system comprises light detectors (plural) for detecting fluorescence emission intensity, and/or for fluorescence imaging, and/or for determining the spectral distribution of fluorescence intensity and establishing signals thereof. Jang further discloses a single and/or linear array of detectors made of photomultiplier tubes, digital camera, CCDs, CMOS cameras, etc. (see Col. 9, lines 49-65). The fluorescence detectors function to measure/calculate/determine various chemical and physical properties of the fluorescent fibers being studied, including

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geometric properties such as fiber width, coarseness, and Kappa number (i.e., lignin content).

The system also includes data processing and recording means (15) for recording, analyzing, and outputting the data (see Col. 10, lines 5-6).

The fluid-suspended fibers are flowed through a flow cell (4) in order to achieve "rapid measurements such as in an online instrument." The cross-section of a flow cell can be square, rectangular, and circular in shape. The invention is disclosed as being capable of working for fibers that are either flowing/moving, or stationary (see Col. 9, lines 25-30). In one aspect of the invention of Jang, fibers were dyed with a fluorochrome (i.e., fluorescent dye) (see Col. 4, lines 34-36).

While Jang discloses the use of a flow cell (4), there is no mention in patent '955 of an inlet or outlet of the flow cell; nor is a transparent "sample holding region" described. However, it is well known in the art that a flow cell must by definition comprise an inlet and an outlet in order for fluid flow through the cell to be achieved. Thus it would have been obvious to one of ordinary skill in the art to use a flow cell having an inlet/outlet and a holding region, so that sample could be flowed through the cell. Also, while Jang does not specifically disclose a conduit for delivering a pulp sample to the inlet of the flow cell, it would have been obvious to one of ordinary skill in the art to provide such a conduit, again, to utilize said flow cell for its stated purpose. One of ordinary skill in the art would be well apprised of the fact that only such a flow cell configuration would make "online measurement," disclosed by Jang, possible. It would have been obvious to one of ordinary skill to utilize a flow cell having a

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transparent sample holding region, in order to use the fluorescence analyzer device of Jang to determine the various properties of a fiber sample.

Jang also does not specifically teach the "means to control an amount of stain in solution in the flow cell to an extent desired without undesirably reducing an amount of stain that is bound to the pulp fiber sample" recited in claim 19.

Lichtwardt et al. (hereinafter, "Lichtwardt") teach a chemical metering and control system for maintaining a desired level of a pesticide (or other chemical) in any open or closed channel flow stream with fluctuating flow rates (see Abstract). The system dispenses an amount of the pesticide (or other chemical) mixed with an indicating dye at an injection point along a system flow stream, and then takes a sample of the flow stream downstream from the injecting point to determine how much indicating dye is present in the flow stream. More specifically, at the sampling point, a pump extracts a flow stream sample and passes the sample to a fluorometer which measures the amount of fluorescent indicating dye injected upstream so that a proportional integral derivative (PID) controller can adjust the level of the pesticide/dye mixture in order to achieve the appropriate concentration of pesticide in the flow stream (see Col. 1 line 60 thru Col. 2 line 10).

It is noted that while the apparatus of Lichtwardt is disclosed as working upon a different material than does the apparatus claimed in the present invention, the material worked upon is of no significance in determining patentability of the claims herein. In fact, the Courts have held that "inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." See *In re Young*, 75 F.2d 996, 25 USPQ 69 (CCPA 1935). Thus, while Lichtwardt's chemical control system is

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disclosed as working on a pesticide/fluorescent dye mixture, it would be perfectly capable of controlling the release of another chemical, e.g. dye, in the invention of the present application.

It would have been obvious to one of ordinary skill in the art to modify the fiber-analyzing apparatus of Jang with the chemical control system of Lichtwardt, in order to closely monitor and control the concentration of the fluorescent dye in solution.

11. **Claims 20 and 23-26, and 50** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang (US 6,806,955) in view of Lichtwardt et al. (US 5,902,749) as applied to claim 19 above, and further in view of Ogino et al. (US 5,436,717).

Jang/Lichtwardt do not specifically disclose the optical configurations outlined and recited in claims 20 and 23-26 of the instant application.

Ogino et al. (hereinafter, "Ogino" or '717) teach a dichroic mirror (Fig. 8, #46) positioned proximate to a strobe light source (Fig. 8, #42) so as to allow light from said light source through to irradiate a flow cell (Fig. 8, #16). Another dichroic mirror (Fig. 8, #28) is positioned so as to direct light passing through the flow cell toward a photodetector (Fig. 8, #34). '717 further discloses a second photodetector (Fig. 8, #38), as well as a signal processor (Fig. 8, #52) for receiving and processing the signals from the two photo detectors (see Col. 4, lines 40-44). The photo detector (Fig. 8, #34) is substantially orthogonal to the dichroic mirror (Fig. 8, #28). '717 teaches the provision of an objective lens (Fig. 8, #26) that is substantially perpendicular to the beam of light emitted from the strobe light source (Fig. 8, #42). Furthermore from Fig. 8, it is clear that the dichroic mirror (Fig. 8, #46) of '717 is positioned approximately 45-degrees with



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respect to the light beam and image path, and is located between the objective lens (#26) and another dichroic mirror (#30).

It would have been obvious to one of ordinary skill the modify the combination of Jang/Lichtwardt with the optical configurations of Ogino as outlined above, in order to achieve fluorescent particle analysis "without difficulty in position adjustment" (of the optical/flow cell arrangement). It would have been obvious to provide two photo detectors in order to detect different wavelengths of emitted fluorescence from a particular sample.

12. **Claims 32-34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang (US 6,806,955) in view of Lichtwardt et al. (US 5,902,749) as applied to claim 19 above, and further in view of Holm et al. (US 4,172,524).

Jang/Lichtwardt do not specifically disclose an automated synchronized imaging system.

Holm et al. teaches an inspection system for detecting excessive particulate matter comprising multiple cameras, and synchronization means. Horizontal and vertical sync lines synchronize the operation of the imaging system (see col. 15, lines 37-44).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the synchronized imaging system as taught by Holm et al. with the combined invention of Jang/Lichtwardt, because synchronization of the images allows for analytical comparison of the same sample.

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13. **Claims 51 and 56** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang (US 6,806,955) in view of Ogino et al. (US 5,436,717).

Jang teaches a method and apparatus for measuring physical and chemical properties of fibers and fiber-like particles (see Title/Abstract). The device of Jang comprises a light source (1) for applying excitation light at a selected wavelength to fibers to produce fluorescence emission light having a fluorescent spectral distribution (see Col. 8 line 65 thru Col. 9, line 9). A Xenon lamp may be used as the light source, for example (see Col. 9, line 7).

The system further comprises a detector (2) for detecting/monitoring the intensity of excitation light, and an excitation/collection optics system including filters and a dichroic mirror (see Col. 9, lines 12-23). The light/optics system further comprises a beam splitter (5) and collection optics (6,9) including lenses, cameras, and/or fiber optics (see Col. 9, lines 35-40). Barrier/bandpass filters (7,10) allow for selecting different and/or same regions of fluorescence emissions to be detected, analyzed, and/or imaged. Jang specifically discloses two long-pass filters with 420 nm for short and 520 nm for long cut-on wavelengths.

A fluorescence detector/imaging/spectral analyzer (8, 11) system comprises light detectors (plural) for detecting fluorescence emission intensity, and/or for fluorescence imaging, and/or for determining the spectral distribution of fluorescence intensity and establishing signals thereof. Jang further discloses a single and/or linear array of detectors made of photomultiplier tubes, digital camera, CCDs, CMOS cameras, etc. (see Col. 9, lines 49-65). The fluorescence detectors function to measure/calculate/determine various chemical and physical properties of the fluorescent fibers being studied, including

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geometric properties such as fiber width, coarseness, and Kappa number (i.e., lignin content).

The system also includes data processing and recording means (15) for recording, analyzing, and outputting the data (see Col. 10, lines 5-6).

The fluid-suspended fibers are flowed through a "sample volume" (i.e., flow cell 4) in order to achieve "rapid measurements such as in an online instrument." The cross-section of a flow cell can be square, rectangular, and circular in shape. The invention is disclosed as being capable of working for fibers that are either flowing/moving, or stationary (see Col. 9, lines 25-30). In one aspect of the invention of Jang, fibers were dyed with a fluorochrome (i.e., fluorescent dye) (see Col. 4, lines 34-36).

Jang does not specifically disclose that the provided dichroic mirror splits the stimulated light into a first portion and a second portion. Jang also does not teach a second detector configured to receive the second portion of stimulated light.

As discussed previously, Ogino teaches a fluorescence particle analyzer with an optical system comprising two photodetectors (34, 38). A dichroic mirror (Fig. 8, #46) positioned proximate to a strobe light source (Fig. 8, #42) so as to allow light from said light source through to irradiate a flow cell (Fig. 8, #16). Another dichroic mirror (Fig. 8, #28) is positioned so as to direct light passing through the flow cell toward a photodetector (Fig. 8, #34). '717 further discloses a second photodetector (Fig. 8, #38). Signal processor 52 receives and processes the signals from the photo detectors (see Col. 4, lines 40-44). The photo detector (Fig. 8, #34) is substantially orthogonal to the dichroic mirror (Fig. 8, #28).

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Fig. 4 shows that dichroic mirror 28 allows some light to pass to detector 38, while reflecting some light to detector 34 (note that a filter 32 is placed between dichroic mirror 28 and detector 34).

It would have been obvious to one of ordinary skill in the art to provide a dichroic mirror such as Ogino to the device of Jang, in order to split a beam of light into two separate distinct portions for analysis by different detector devices. It would have been obvious to provide the device of Jang with two detectors instead of just one, in order to be able to receive and analyze/process said two distinct separated portions of light.

#### ***Allowable Subject Matter***

14. Claims 52-55 and 57 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

15. Claims 28, 30-31, 35-38, and 48-49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jeffers et al. (US 5,486,915) teaches the measurement of lignin concentrations from wood pulp samples using a method involving the application of excitation light to cause fluorescence emission of lignin. Renard et al. (US 4,837,446) discloses an apparatus for testing the uniformity of a papermaking pulp with respect to

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the lignin associated with individual fibers comprising substantially simultaneous analysis of individual fiber length and fluorescence of the lignin associated with such individual fiber. Berthold et al. teach a fluorescence analyzer for lignin, comprising a light emitting arrangement for emitting an excitation light, and a fluorescence light detector for detecting said emitted fluorescent light.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cedric A. Chan whose telephone number is (571) 270-3721. The examiner can normally be reached on Monday-Thursday 8:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C.C./  
July 31, 2008

/Jill Warden/  
Supervisory Patent Examiner, Art Unit 1797